5
ANALYTICS AND APPLIED MAPPING 2008 ANNUAL REPORT

The Planning and Economic Development Committee recommends the following:

1. **Receipt of the presentation by Nancy Prout, Director, Geomatics; and**

2. **Adoption of the recommendation contained in the following report dated November 28, 2008, from the Commissioner of Planning and Development Services.**

1. RECOMMENDATION

It is recommended that:
1. This report be received for information.

2. PURPOSE

This report highlights the key activities, products and services delivered in 2008 by the Analytics and Applied Mapping section of the Geomatics Branch.

3. BACKGROUND

In addition to developing and maintaining a robust geospatial infrastructure, technology, tools, and managing geospatial information, the Geomatics Branch also provides geospatial analysis, high quality mapping and GIS training to support the business needs of Regional Departments, York Regional Police, YorkInfo Partners and the public.

The integration of Geographic Information Systems (GIS) information, technology and analysis into business processes contributes to more timely and informed decision making by Regional staff. The increasing complex nature of client requests demonstrates the evolving understanding and appreciation of adopting this technology into business processes.

Quality information, easy-to-use tools and a robust infrastructure combined with an extensive training program promote a self service environment that supports Regional staff in the use of GIS in their daily activities.

4. ANALYSIS AND OPTIONS

4.1 800 Value-added products and services delivered

Geomatics responds to hundreds of requests for spatial analysis, and quality map products from the corporation, partners, private sector and the public (Tables 1 and 2). Staff strive toward ensuring excellence in quality, efficiency and customer service in the delivery of these products and services.

Products comprise spatial analysis, spreadsheets, project related datasets, spatial statistics, charts, and creation of hardcopy and digital maps. The time required to conduct analysis and create map products is determined by the complexity of the request and availability of information.

Table 1
Value Added Products Delivered by Client Category

Client Category	No. Products	Percentage
Regional Departments	664	83%
YorkInfo Partners	58	7%
External Clients	78	10%
Total	**800**	**100%**

Table 2
Value Added Products Delivered by Internal Client Groups

Internal Client Group	No. Products	Percentage
Planning and Development Services	178	27%
Community and Health Services	121	18%
York Region Rapid Transit Corporation	82	12%
Environmental Services	63	9%
Corporate Services	53	8%
Finance Services	42	6%
Transportation Services	37	6%
Emergency Management	29	4%
York Regional Police	26	4%
Office of the Chief Administrative Officer	12	2%
York Region Transit (YRT)	11	2%
Emergency Medical Services (EMS)	6	1%
Council	4	1%
Total	**664**	**100%**

4.2 Enhanced Service Delivery

Ensuring a user friendly self service environment for both corporate GIS users and the public is a major focus of the Analytics and Applied Mapping section.

Self-Service Bureau simplifies quality map making

The Self-Service Bureau (SSB) centralizes corporate GIS users' access to geospatial information, user tools, published maps and GIS documentation. Templates and predefined standardized symbology enable users to quickly create their own high quality maps. The MapLibrary allows Regional staff to view and download from hundreds of maps created by either professional GIS staff or corporate power GIS users. The annual user focus group meeting gives users the opportunity to recommend further enhancements.

In 2008 enhancements included:

- 5 customized templates were created for York Regional Police crime analysts expanding the Self Service Bureau to serve client groups beyond the Region for the first time
- 2 new site and orthophotography templates increase the number of map templates to 50
- 2006 Census information is available to users through 16 layer files and 38 published maps
- 229 maps are currently in MapLibrary accessible within the corporation.

Clients identify their product schedule needs

To ensure customer service and keep up with rapid change, products and applications that require regular maintenance or updates on a quarterly, bi-annual or annual basis are scheduled into a maintenance cycle. This approach improves work planning and ensures that clients receive their products when they are needed.

Maps accessible to the public through internet

The public can view, print or download over 146 published maps from YorkExplorer the Region's internet mapping service. This year 169,360 maps were downloaded: an average of 464 map downloads each day. The Region's *Take a Hike Trail Guide* continues to be the Region's most popular map.

4.3 Geospatial analysis, mapping and application development provide information necessary for quality decision-making

Until recently, many of the maps requested were relatively simple in nature, showing feature location, proximity, characteristics and change. As the knowledge of the capability of GIS technology has become more prevalent, clients are requesting more

complex geospatial analysis to help provide a greater understanding of a place, make the best choices, or prepare for future events and conditions. Key projects that required more complex analysis, maps and custom application development are highlighted to illustrate the diversity of GIS application across the Region.

Yonge Street subway expansion

In support of the Yonge Subway expansion from Finch Station into the Richmond Hill Centre GIS was used to examine proposed station locations, 500m walking distance study boundaries, the historic Thornhill area and alignment options. Property code, employment data and parcel fabric were used to estimate existing and forecast population and employment. Density target estimates were also calculated on various Floor Space Index (FSI) numbers. A 3D movie of the Yonge Street corridor from Steeles Avenue to Richmond Hill Centre effectively conveyed the proposed subway station locations and alignment within the existing context.

Access to census information provides demographic profiles

2006 census data were transformed into geospatial information comprising over 20 demographic profiles including population, age, immigration, ethnicity, labour force and dwelling by census tracts and dissemination areas. The data and maps were made available to the corporation and partners through Geomatics' spatial data warehouse.

Over 70 maps were created and incorporated into the self-service environment through demographic maps and tools. 2001 census products were created for comparative analysis to identify demographic trends and indicators for the delivery of regional programs. Knowledge and technology transfer were provided to clients through workshops and presentations. This centralized approach created efficiencies and reduced duplication within the corporation and among the YorkInfo Partners.

Infectious disease analysis and mapping aid early detection and prevention

GIS provides an ideal platform for the convergence of disease-specific information in relation to location, environment and demographics by helping to visualize and identify patterns, trends and interrelationships. In an infectious disease pilot project, campylo-bacter cases were spatially located facilitating density analysis and identification of "hot spots". Temporal mapping of occurrences helped identify peak months of infection. Mapping these results provides a framework that may aid in the early detection and prevention of outbreaks before they reach peak levels of infection.

Custom GIS tools and training help fight crime

Over the past few years York Regional Police crime analysts have embraced GIS technology as a valuable tool to visualize and understand crime occurrence patterns. With this information, police can be more efficient in their crime prevention tactics. In an

effort to ensure that crime analysts are utilizing GIS to its full capability, Geomatics staff job shadowed crime analysts to understand their business requirements. As a result, geospatial tools and training were specifically developed to meet their requirements.

Fire Services run times assist in planning optimum station locations

A fire station run time analysis conducted for Central York and Richmond Hill Fire Services showed areas that would be covered by fire vehicle given variable speed and travel times. Overlapping and underserved areas were identified. Flexibility in the model adapted the analysis to explore various case scenarios such as what would happen if a station was added or moved, or if travel conditions changed.

Health Inspection analysis results in more efficient workload distribution

In an effort to more effectively distribute workload among Public Health Inspectors, over 9,000 inspection locations were assigned a weight factor based on required number of inspections and anticipated time required for each inspection. Based on the results, new Health Inspection areas were delineated and workload was more effectively and equitably assigned.

GIS supports Lake Simcoe freshet flood response

On February 29, due to record snow fall and other environmental conditions, water levels in Lake Simcoe were at their highest in 40 years and potential for major flooding was extremely high. In support of local and Regional response, maps were provided that identified all critical infrastructure within 100m of potential flood areas; potential population impact estimates for evacuation planning were calculated; property code information was used to identify potential vulnerable populations and sites that might contain hazardous materials or chemicals that could contaminate water supply.

4.4 Emergency Management

York Region Geomatics provides geospatial information, technology, products and services to support the Region's Emergency Management activities and is a member of the Regional Emergency Operations Centre team. As emergencies are typically location based, GIS plays an essential role during all five phases of emergency management.

Geomatics undertook the annual review and update of infrastructure critical to the Region's well-being, operations and continuity as required by the *Emergency Management and Civil Protection Act*. In addition to this information being corporately available for emergency management planning and response, updated critical infrastructure geospatial information was distributed to each area municipality and updated maps were provided to their Community Emergency Management Coordinators in January.

Operation On the Move

Geomatics worked with the Lake Simcoe Region Conservation Authority to develop flood mapping based on the Lake Simcoe freshet flood situation to provide a realistic training scenarios for the Region's annual emergency exercise. Geomatics also participated in the exercise as a member of the Regional Emergency Operations Centre team and provided additional inputs including road closures, population and demographic statistics and mapping to plan emergency response and recovery.

4.5 GIS Training and Technology Transfer

An extensive GIS training curriculum is available to Regional staff, York Regional Police and the YorkInfo Partners through the corporate learning program. Nine introductory to advanced level courses provide convenient and cost-effective access to training that provide users with the knowledge and skills essential to take full advantage of GIS technology, information, and the self-service environment. The program is delivered through a modularized training approach which promotes a flexible, phased approach to GIS training. Two new courses "Creating High Quality Cartographic Products" and "Web Services" have been added to the curriculum.

4.6 Future Directions

GIS analysis identifies patterns, relationships, optimizes network and resource allocation, providing answers to support smarter, faster decisions. Increased application of complex geoanalytical capabilities will help regional staff make informed decisions, highlighting the potential of GIS technology.

3D models provide a unique perspective of York Region's landscape and city centres. Modelling techniques and visualization will effectively communicate current and future scenarios for regional initiatives.

New interactive quality map products that are linked to robust geospatial information will be made more accessible to regional staff and the public by using new software capabilities and simplified web view publication processes.

Geomatics self service environment enhancements will continue through the creation of updated standard templates, symbology and cartographic standards for GIS users.

5. FINANCIAL IMPLICATIONS

Service level agreements with key client groups define product delivery, service level expectation and associated costs.

6. LOCAL MUNICIPAL IMPACT

Area municipalities benefit from York Region geospatial information, technology, products and services through the YorkInfo Partnership. Various products and services are also made available to residents on many municipal websites.

7. CONCLUSION

Geomatics continues to achieve a high level of customer service and satisfaction through the timely delivery of quality, value-added mapping products and services that have become an integral part of business processes in York Region.

As 3D visualization technologies and methods continue to mature, Geomatics will advance in the creation of dynamic 3D models to illustrate and analyze the Region.

Training initiatives, new internet mapping views and the enhanced GIS self service framework put the power of routine map creation and analysis in the hands of the public and regional staff.

For more information on this report, please contact Debra Kelloway, Manager, Analytics and Applied Mapping at 905-830-4444 ext. 1536 or Nancy Prout, Director, Geomatics Branch at ext. 1529.

The Senior Management Group has reviewed this report.

(The attachment referred to in this clause is included with this report.)